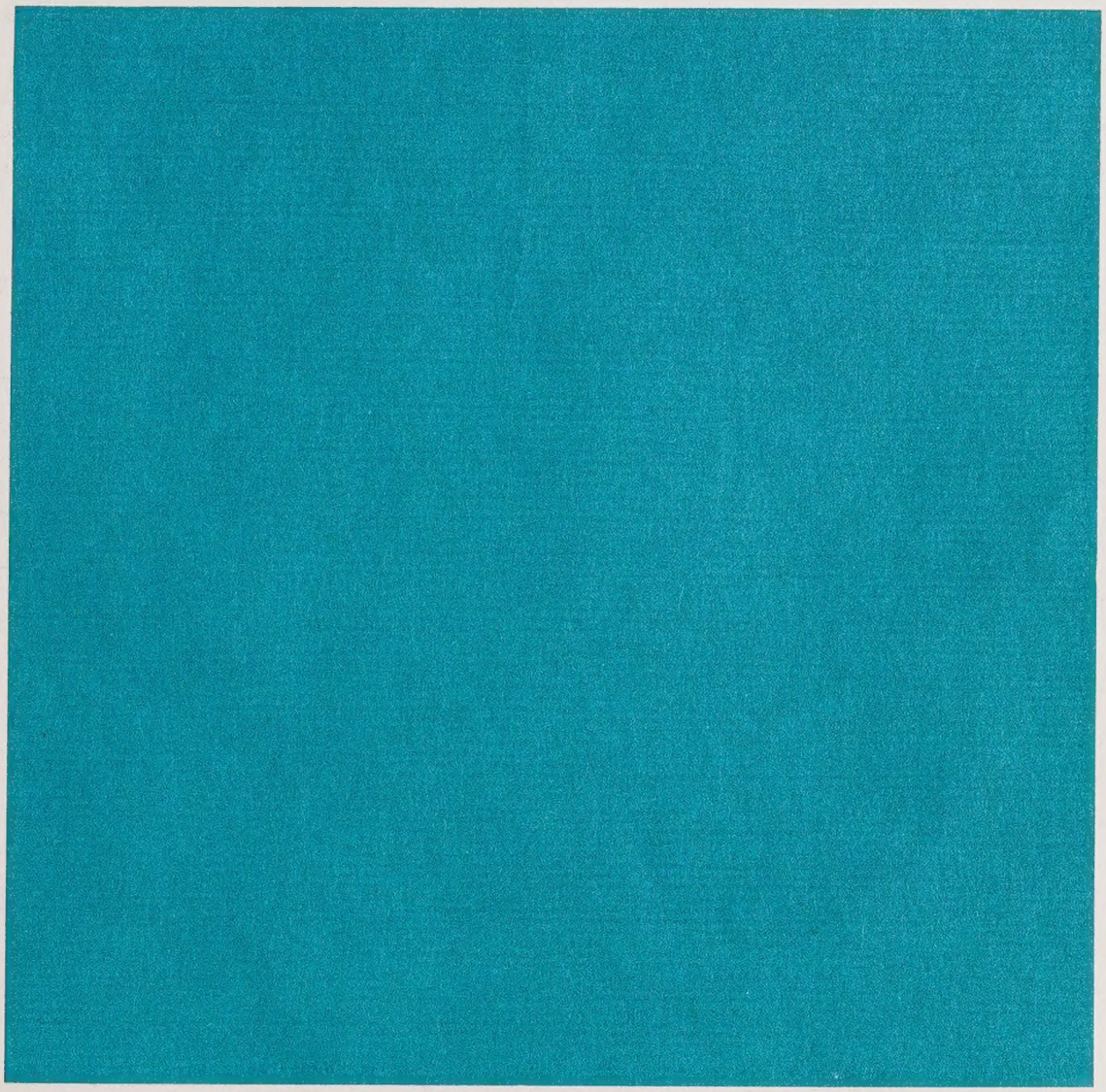
ENERGY



THE COMPREHENSIVE PLAN

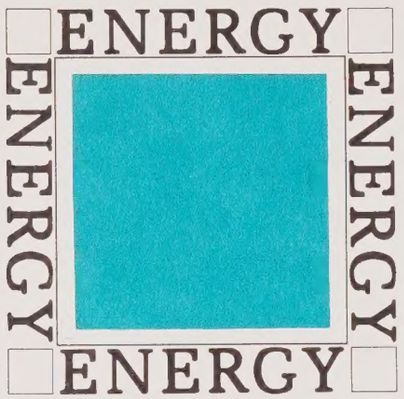
CITY & COUNTY OF SAN FRANCISCO

THE MASTER PLAN

It shall be the function and duty of the commission to adopt and maintain, including necessary changes therein, a comprehensive, long-term, general plan for the improvement and future development of the city and county, to be known as the master plan. The master plan shall include maps, plans, charts, exhibits, and descriptive, interpretive, and analytical matter, based on physical, social, economic, and financial data, which together present a broad and general guide and pattern constituting the recommendations of the commission for the coordinated and harmonious development, in accordance with present and future needs, of the city and county and of any land outside the boundaries thereof which in the opinion of the commission bears a relation thereto.

Excerpt, Charter of the City and County of San Francisco.

THE COMPREHENSIVE PLAN



City and County of San Francisco • Department of City Planning

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The Energy Policy component of the Environmental Protection Element was adopted by Resolution No. 9409 of the San Francisco City Planning Commission on June 3, 1982.

The preparation of the policy was financed in part through the California Energy Commission and the U.S. Department of Energy.

Photography Courtesy Of:

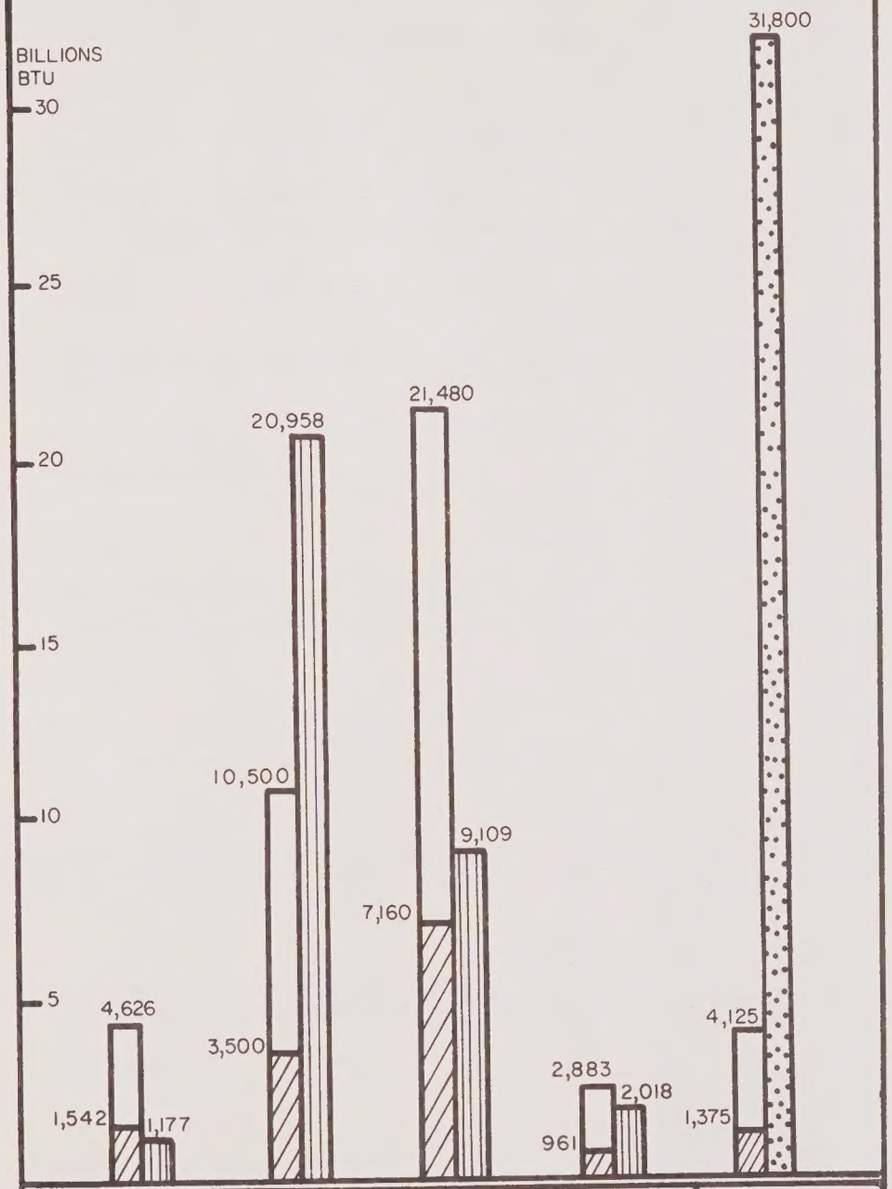
Bill Owyang - S.F.P.U.C. pages 6 & 15
Rides For Bay Area Commuters - page 13, bottom right
PG&E - pages 8 & 13
Fred Stuprich - D.C.P. Staff Photographer, all others

Graphics Assistance: Clarence Lee

ENERGY DEMAND & COSTS

ENERGY DEMAND:

SAN FRANCISCO ENERGY CONSUMPTION 1979-1980 (BILLIONS OF BTU).



GOVERNMENTAL	RESIDENTAL	COMMERCIAL	INDUSTRIAL	TRANSPORTATION
5%	29%	28%	5%	33%

NATURAL GAS CONSUMPTION

ELECTRICITY CONSUMPTION: AT POINT OF USE ONLY.

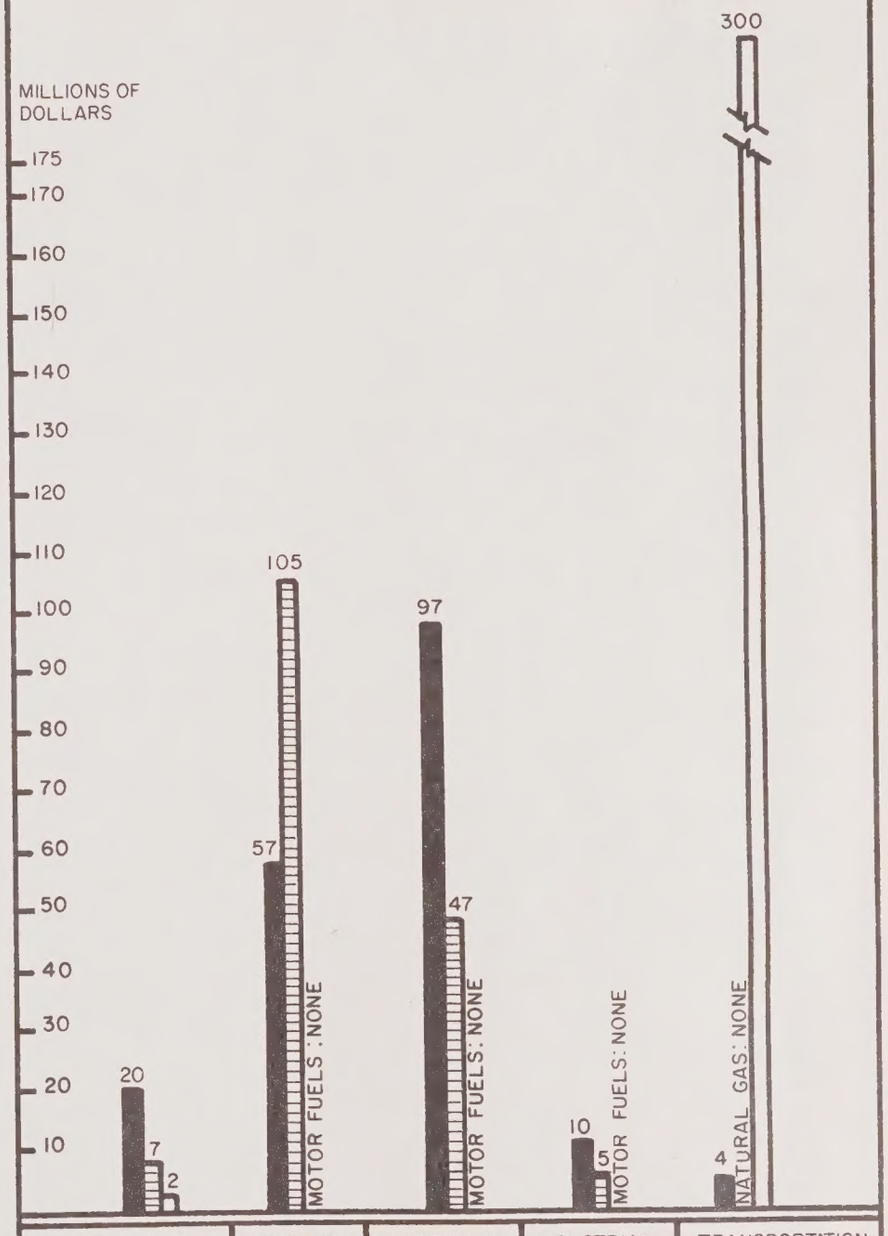
ELECTRICITY CONSUMPTION: TOTAL ENERGY USE.

MOTOR FUELS CONSUMPTION

SOURCE: ENERGY SUPPLY AND CONSUMPTION PATTERNS: TRENDS & PROSPECTS, 1975-1985.

ENERGY COSTS

SAN FRANCISCO ENERGY COSTS 1980.



GOVERNMENTAL	RESIDENTAL	COMMERCIAL	INDUSTRIAL	TRANSPORTATION
TOTAL COST OF ENERGY: 29 MILLION.	TOTAL COST OF ENERGY: 162 MILLION.	TOTAL COST OF ENERGY: 144 MILLION.	TOTAL COST OF ENERGY: 15 MILLION.	TOTAL COST OF ENERGY: 304 MILLION.

ELECTRICITY
TOTAL COST FOR ALL SECTORS: 183 MILLION.

NATURAL GAS
TOTAL COST FOR ALL SECTORS: 169 MILLION.

MOTOR FUELS
TOTAL COST FOR ALL SECTORS: 302 MILLION.

SOURCE: RECOMMENDATIONS FOR REDUCING COMMUNITY ENERGY COSTS (C.E.P.A.C. 1982).

SUMMARY of OBJECTIVES and POLICIES

MUNICIPAL

OBJECTIVE 1

ESTABLISH THE CITY AND COUNTY OF SAN FRANCISCO AS A MODEL FOR ENERGY MANAGEMENT.

Policy 1

Incorporate energy management practices into building, facility and fleet maintenance and operations.

Policy 2

Integrate energy cost reduction measures into the budget process.

Policy 3

Investigate and implement techniques to reduce municipal energy requirements.

Policy 4

Encourage investment in capital projects that will increase municipal energy production in an environmentally responsible manner.

Policy 5

Include energy emergency preparedness plans in municipal operations.

RESIDENTIAL

OBJECTIVE 2

ENHANCE THE ENERGY EFFICIENCY OF HOUSING IN SAN FRANCISCO.

Policy 1

Improve the energy efficiency of existing homes and apartment buildings.

Policy 2

Strengthen enforcement of the State's Residential Energy Conservation Building Standards.

Policy 3

Expand the environmental review process to encourage the use of additional measures to save energy in new housing.

Policy 4

Encourage the use of energy conserving appliances and lighting systems.

Policy 5

Emphasize energy conservation in local government housing assistance programs.

Policy 6

Advocate real estate association participation in residential energy management program efforts.

COMMERCIAL

OBJECTIVE 3

PROMOTE EFFECTIVE ENERGY MANAGEMENT PRACTICES TO MAINTAIN THE ECONOMIC VITALITY OF COMMERCE AND INDUSTRY.

Policy 1

Increase the energy efficiency of existing commercial and industrial buildings through cost-effective energy management measures.

Policy 2

Insure adequate local enforcement of the State's Non Residential Energy Conservation Building Standards.

Policy 3

Expand the environmental review process to encourage the use of additional methods to save energy in new commercial buildings.

Policy 4

Promote commercial office building design appropriate for local climate conditions.

Policy 5

Encourage the use of integrated energy systems to save energy and reduce operating costs.

TRANSPORTATION

OBJECTIVE 4

INCREASE THE ENERGY EFFICIENCY OF TRANSPORTATION AND ENCOURAGE LAND USE PATTERNS AND METHODS OF TRANSPORTATION WHICH USE LESS ENERGY.

Policy 1

Increase the use of transportation alternatives to the automobile.

Policy 2

Provide incentives to increase the energy efficiency of automobile travel.

Policy 3

Encourage an urban design pattern that will minimize travel requirements among working, shopping, recreation, school and childcare areas.

Policy 4

Promote more efficient commercial freight delivery.

Policy 5

Encourage consideration of energy use issues when making transportation investment decisions.

Policy 6

Promote alternate work arrangements which will contribute to more efficient transportation use.

ALTERNATE ENERGY

OBJECTIVE 5

PROMOTE THE USE OF RENEWABLE ENERGY SOURCES.

Policy 1

Develop land use policies that will encourage the use of renewable energy sources.

Policy 2

Remove obstacles to energy conservation and renewable energy systems in zoning and building codes.

Policy 3

Develop information resources to assist in the use of renewable energy.

INTERGOVERNMENTAL

OBJECTIVE 6

SUPPORT FEDERAL, STATE AND PG&E ENERGY PROGRAMS THAT ARE EQUITABLE, AND ENCOURAGE CONSERVATION AND ALTERNATIVE ENERGY USE.

Policy 1

Support continuation of State and Federal tax incentives and credits for conservation and renewable energy technologies.

Policy 2

Promote State energy building standards that are cost-effective and take into account San Francisco's climate and density patterns.

Policy 3

Encourage PG&E involvement in energy management programs for residential, commercial and industrial users.

FINANCING

OBJECTIVE 7

DEVELOP FINANCING OPPORTUNITIES TO IMPLEMENT LOCAL ENERGY PROGRAMS.

Policy 1

Promote government and private financing partnerships to carry out local energy programs.

Policy 2

Encourage private financial institutions to offer energy loan programs responsive to local market needs.

Policy 3

Establish a self-supporting system for funding municipal energy cost reduction investments.

Introduction

Events of the past decade have brought the issue of energy fully into public view. Ever-increasing energy prices, combined with constraints in the development of conventional energy supplies, have forced the public to question and debate the energy future they would like to see. The debate has centered on public and governmental participation in pricing and energy supply issues.

San Francisco, through its regulatory and planning activities, directly influences how, and to what extent, energy is used in the city. Local regulations governing the design, construction and use of buildings affect operational energy needs. Transportation policy decisions directly affect petroleum-based fuel requirements. Daily decisions on these and other issues should occur within a locally approved policy framework, since they will help determine San Francisco's energy future for decades to come.

Increasing the efficiency of energy use is predicated on matching needs with resources. Morever, the local setting is an important aspect of this process and should be taken into consideration when developing a citywide energy policy. In tackling its energy problems, San Francisco has two natural assets: mild climate and compact urban form. The city's temperate climate effectively eliminates the need for mechanical air conditioning, with the exception of commercial buildings that are sometimes overheated by interior lighting. San Francisco's density reduces the energy requirements for transportation and increases the economic feasibility of co-generation, district heating and integrated energy systems.

This Energy Policy provides the City and County of San Francisco with a comprehensive and pragmatic energy management program that can promote a productive collaboration between municipal government and local residents. This document should guide both public and private decisions affecting the use of energy.

San Francisco's Energy Policy was designed with four goals in mind: (1) increasing the efficiency with which energy is used locally; (2) diversifying the present balance of resource supplies to meet local energy needs; (3) fostering the economic development of energy management services and renewable energy systems; and (4) encouraging the active participation of members of the community to carry out this program. Seven objectives are set forth to achieve these goals. The first four objectives address energy management opportunities in the government, residential, commercial and transportation sectors. The fifth encourages renewable resource use. The remaining two objectives focus on the complex and interrelated roles of municipal government, PG&E, and State and Federal governments in energy management and financing activities.

Each objective is accompanied by policies and arguments to clarify the objective's intent. The report of the Citizens Energy Policy Advisory Committee to the Planning Commission, Board of Supervisors and the Mayor outlines many of the actions and programs needed in the next few years to carry out these objectives and policies.

Goals

The objectives and policies contained in the Energy Policy are based on the premise that energy management programs for San Francisco should be designed to protect and enhance the economic and environmental well being of City residents. This is to be accomplished through:

1. More Efficient Use of Energy

Conservation is best understood as a productive enterprise designed to increase the energy efficiency of public and private activities within the City. Substantial energy savings can be produced without requiring either major changes in lifestyle or economic dislocation. Increasing the efficiency of energy use will benefit the local economy by reducing the flow of dollars exported outside the region for fuel needs.

Measured in terms of economic payback, quantity of supply and prevention of environmental disruption, energy conservation becomes a preferred strategy when compared to the increased use of conventional fuels or the development of new fuel sources. It will provide San Francisco residents with the cheapest, most accessible and least disruptive energy supply alternative.

2. Balance of Energy Supplies to Meet Local Needs

Pacific Gas and Electric Company supplies electricity and natural gas to San Francisco. Hydro, oil and natural gas comprise the primary energy sources used to generate electricity, with lesser amounts coming from geothermal and nuclear fuels. Most natural gas is shipped either from Canada or the Southwest, with the balance coming from California producers. The Hetch Hetchy system provides electricity for City and County municipal operations.

PG&E will be shifting to an increased deployment of renewable, alternate energy resources such as solar, geothermal, co-generation and wind. This Energy Policy envisions and encourages a similar energy future for San Francisco. It is consistent with the assessment of the California Energy Commission that renewable energy resources will provide State residents will the greatest long term monetary, social and environmental benefits. The Commission believes local public policy should be directed toward the accelerated development of these resources through both private and municipal actions.

Although these energy alternatives will not displace conventional fuels in the near future, their development will provide San Francisco residents with a more varied resource mix that will be less susceptible to supply and price uncertainties.

3. Economic Development

A citywide energy program has significant job development implications. Reducing utility expenditures will redirect money currently going to energy suppliers outside the region back into the local economy. This bolsters local jobs and can help foster economic development. Increased reliance on conservation and renewable energy technologies will expand local job opportunities, since these industries tend to be labor-intensive in nature.

Job training programs should recognize employment opportunities arising from implementation of local energy programs. Certain energy service enterprises should be located in neighborhood commercial areas, while other energy related manufacturing firms require industrial sites. These needs can be addressed within the City's land use policies.

4. Responsible Community Participation

An effective local energy management program is contingent upon responsible participation from all members of the community. This requires the formation of a partnership between the private and public sectors to coordinate their efforts in finding acceptable solutions to energy problems facing San Francisco. Solutions based on proven and economical methods are the most reliable way of transforming San Francisco into an energy efficient urban community.

The City fostered such participation through the Mayor's appointment of a Citizens Energy Policy Advisory Committee (CEPAC) in 1981. This sixteen member group, representing a variety of community interests, has helped guide the preparation of the Energy Policy.

MUNICIPAL

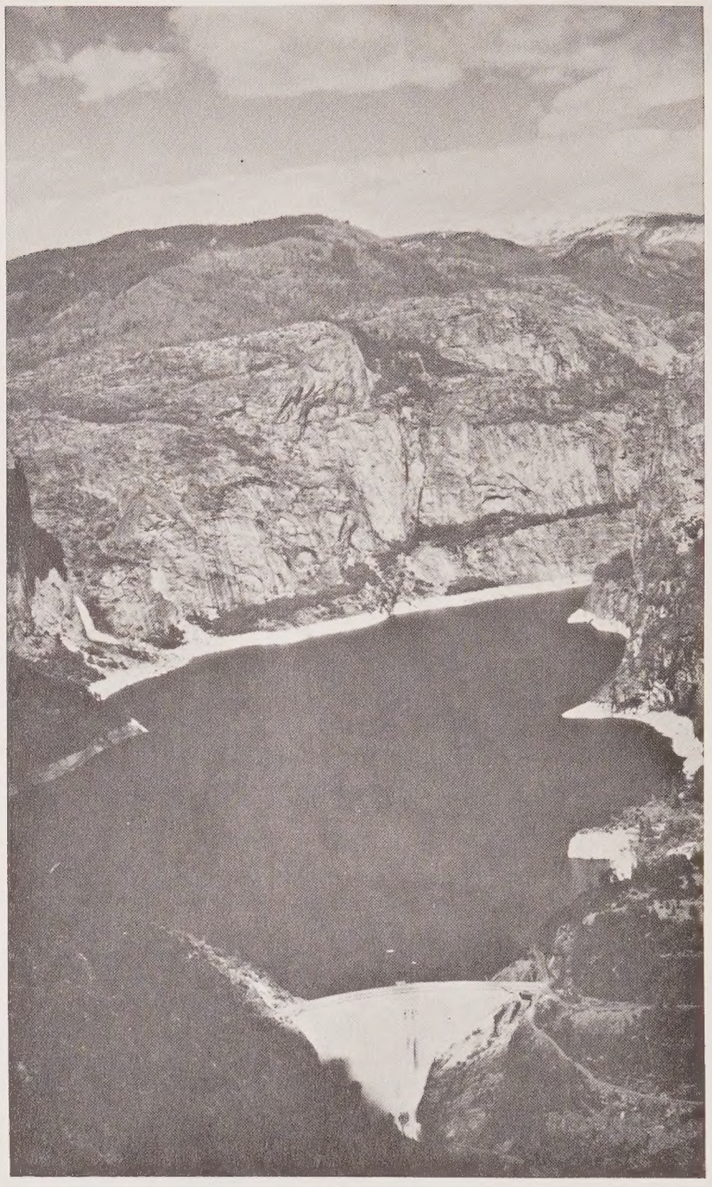
OBJECTIVE 1

ESTABLISH THE CITY AND COUNTY OF SAN FRANCISCO AS A MODEL FOR ENERGY MANAGEMENT.

Municipal government accounts for a small, but growing fraction of San Francisco's total energy use. In 1979, the combined Governmental sector (Federal, state and local) used 3% of the natural gas, and 20% of the electricity supplied to the City. The municipal energy budget in 1980 amounted to $21 million. Electricity demand is expected to increase significantly in the future as municipal wastewater treatment and electrified transit programs are implemented.

Electricity is supplied to municipal facilities through Hetch Hetchy, the City-owned hydro electric facility. Natural gas is supplied by Pacific Gas and Electric Company. Adequate hydro capacity is available to meet projected municipal electrical demand. In this context, electrification of the municipal transit system provides a two fold benefit. It reduces oil dependency while increasing overall reliance on a renewable energy resource, i.e., water.

The City and County should set a positive example for the rest of San Francisco in the management of energy resources. First and foremost, local government should develop a strong internal energy conservation program to learn first hand what management techniques are available to the community. Reducing energy use will reduce operational expenditures, while providing additional city revenues through the sale of conserved energy to private customers.



HETCH HETCHY HYDRO PROJECT

There are excellent opportunities for saving energy within municipal government. Many energy management measures can be incorporated into routine maintenance and operating procedures at virtually no cost. Other measures require a minor investment, while providing a financial return within one or two years. Still others offer longer term monetary and energy savings to San Francisco, while requiring extensive financial investment. A program of budgetary incentives should be developed to encourage City agencies to save energy. Comprehensive municipal energy management requires the participation of all departments and the political and financial support of the Mayor and the Board of Supervisors.

POLICY 1

INCORPORATE ENERGY MANAGEMENT PRACTICES INTO BUILDING, FACILITY, AND FLEET MAINTENANCE AND OPERATIONS.

The City has already begun taking the first step in municipal energy conservation by increasing the energy efficiency of existing facilities. A primary conservation technique involves building energy audits that identify potential energy saving practices and capital investment options. Reductions in electricity use offer the greatest potential, since municipal buildings consume energy primarily for heating, ventilating, air conditioning (HVAC) and lighting needs. Much of this potential could be realized through changes in operational and maintenance procedures. Energy monitoring reports, issued on a regular monthly basis, provide a means for comparing actual and budgeted energy use.

The City and County of San Francisco owns and operates a sizable vehicle fleet. Management practices involving the operation and maintenance of these vehicles provide a method for reducing unnecessary fuel usage. A scheduling system for vehicle maintenance would, for instance, insure that energy conservation actions are taken on a planned basis. Gasoline, diesel, and electricity consumption would be affected. Education is critical to an effective fleet energy management program since personal driving habits greatly influence overall energy requirements.

POLICY 2

INTEGRATE ENERGY COST REDUCTION MEASURES INTO THE BUDGET PROCESS.

Once measures have been taken to improve maintenance and operations, additional energy cost savings can be obtained from retrofit investments and the acquistion of new assets. Energy criteria should be considered in purchase decisions to allow the City to identify and evaluate cost reduction investment opportunities.

Payback is a reliable measure for appraising municipal investments opportunities in energy conservation and renewable technologies. Payback provides an indication of the length of time required to recover an initial investment in an energy saving measure based on the dollar value of the energy savings resulting from that investment. It can help answer such questions as whether the City should replace its incandescent street lights with fluorescent or low sodium lights.

Life cycle cost analysis is a useful method for assessing municipal decisions on the purchase of capital equipment. The cost-effectiveness of the item is evaluated by combining the initial cost of the asset with all of the related energy costs associated with using the asset over its expected life. In many cases, a higher priced item might be a better investment if its operational costs for energy use are relatively low over time. Life cycle cost analysis should replace the current municipal bid process, which emphasizes initial costs to the exclusion of life time operational costs in purchasing decisions.

POLICY 3

INVESTIGATE AND IMPLEMENT TECHNIQUES TO REDUCE MUNICIPAL ENERGY REQUIREMENTS.

When low cost energy management practices have been incorporated into operations and maintenance procedures, emphasis should be placed on capital investments that would reduce municipal energy demand still further. State of the art energy technologies, such as solar water heating systems, should be considered for use in municipal demonstration projects. The Steinhart Aquarium in Golden Gate Park is a successful example of a solar retrofit demonstration project. Co-generation systems might provide an attractive investment for facilities such as schools and hospitals that have large space heating needs. Governmental buildings with constant hot water but seasonal space heating requirements could be likely candidates for separate boiler systems. Such applications increase the efficiency of energy use while providing opportunities to inform and educate the public.

In new City and County facilities, redevelopment projects, and extensive rehabilitation or modernization work, building design should be encouraged that will minimize overall energy requirements. Recently completed State and Federal facilities in Northern California consume substantially less energy than is currently allowed under the State's Title 24 energy conservation standards. District heating and other "total energy" systems can provide economical alternatives to less efficient decentralized

energy systems. Demonstration projects of this type would set an example to the private sector on feasible methods to reduce energy budgets for major new projects.

SOLAR AT STEINHART AQUARIUM

POLICY 4

ENCOURAGE INVESTMENT IN CAPITAL PROJECTS THAT WILL INCREASE MUNICIPAL ENERGY PRODUCTION IN AN ENVIRONMENTALLY RESPONSIBLE MANNER.

The City's Hetch Hetchy system currently provides ample electricity to meet all municipal needs. Excess power is sold to other government agencies and private customers, providing revenues to the City and County. Recent studies have indicated that Hetch Hetchy's electrical capacity could be increased through investments in a variety of projects, including small hydro development throughout the system. Such expansion should be undertaken in conjunction with careful consideration of the environmental consequences to the surrounding region.

The City and County has several additional opportunities to increase municipal energy production capability in an environmentally responsible manner. These include participation in a solid waste to energy plant to produce electricity, treatment of sewerage for possible production of methane gas, and involvement in community waste recycling efforts. These projects would alleviate current waste problems while producing fuels that might prove useful in governmental demonstration projects.

POLICY 5

INCLUDE ENERGY EMERGENCY PREPAREDNESS PLANS IN MUNICIPAL OPERATIONS.

The City and County of San Francisco should be prepared for possible fuel shortages or disruptions in energy supplies due to political or economic events in addition to emergency situations resulting from natural disasters such as earthquakes. These situations could have a severe impact on important municipal services normally supplied to the public. Energy contingency plans are essential to minimize impacts on the health safety, and general welfare of the public. Such plans should be coordinated with State emergency preparedness efforts.

San Francisco's energy emergency preparedness plan should emphasize management systems such as fuel rationing, delineation of essential and non essential services and restricted vehicle operations that would ensure the continued provision of essential public services. In addition, community preparedness and financial management strategies should be examined to reduce local economic dislocations from sudden energy scarcity and price increases.

RESIDENTIAL

OBJECTIVE 2

ENHANCE THE ENERGY EFFICIENCY OF HOUSING IN SAN FRANCISCO.

San Francisco's residents have seen their utility bills rise well beyond the rate of inflation. Higher utility costs only exacerbate the fact that the city is one of the most expensive housing markets in the nation. The Federal government has reduced its funding commitments to energy conservation. The State's role in residential energy conservation, though important, has also been limited by budget cutbacks. As a result, city government must provide leadership in working with the private sector and PG&E to stabilize energy costs.

The residential sector consumes nearly one fourth of the electricity and approximately two-thirds of the natural gas used in San Francisco. San Franciscans use considerably less electricity than average PG&E residential customers, although they consume close to the average amount of natural gas. Natural gas is used primarily for space and water heating, while electricity is used for lighting and appliances. Older housing typical of San Francisco is poorly insulated and requires more heating, and generally contains fewer appliances. Natural gas usage represents the largest energy savings potential in the residential sector, through the implementation of cost-effective weatherization measures and more efficient operation of space and water heating systems.

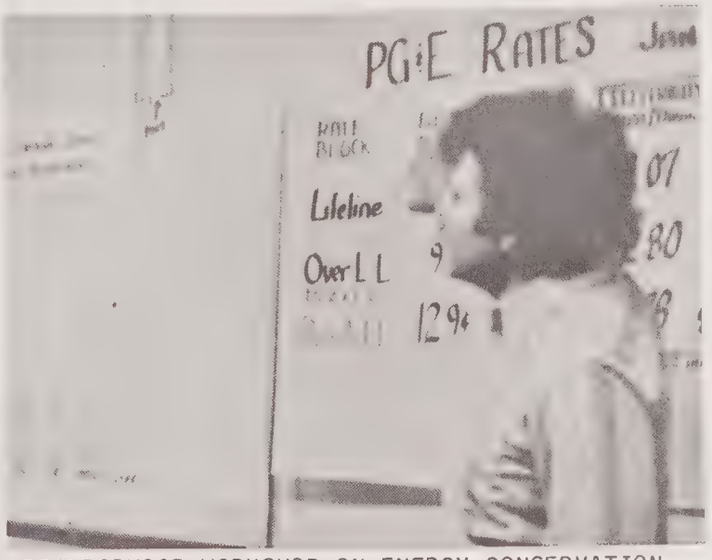
Actions taken to increase the efficient use of energy may raise initial housing costs for private owners in some cases. These actions will, however, promote affordable housing in the long run by reducing annual utility expenses. San Francisco residents can save substantial sums of money and energy by undertaking an aggressive energy managment program that includes community education and promotion, regulation, creative financing, and some capital investment. Special emphasis should be devoted to programs that benefit the city's renter and elderly residents, since this portion of the population pays a higher proportion of their income on energy bills.

POLICY 1

IMPROVE THE ENERGY EFFICIENCY OF EXISTING HOMES AND APARTMENT BUILDINGS.

The vast majority of the City's homes and apartment buildings were built prior to the adoption of California's building energy standards. Economical remedial energy measures are currently available that can produce significant energy and monetary savings to residents of these structures. These measures include, but are not limited to, increased levels of ceiling insulation, weatherstripping and caulking of windows and exterior doors, low flow showerheads, therm ostat setbacks, water heater blankets and electric ignition devices for appliances. Implementation of these measures on a Citywide level would reduce projected expenditures for energy by millions of dollars, and at a relatively low cost to the city's residents.

A special problem exists in attempts to upgrade the energy efficiency of San Francisco's apartment buildings. Tenants pay utility bills, either directly when billed by PG&E, or indirectly when landlords pass through utility costs in rents. As a result, landlords have little incentive to install energy management measures. Likewise, tenants are reluctant to make capital improvements to their apartments for a number of reasons: many tenants move relatively frequently, making justification of capital improvements difficult; tenants perceive building improvements as a landlord responsibility; and, in master metered buildings, tenants who reduce their energy consumption often are not rewarded by lower utility charges and/or rent reductions.



NEIGHBORHOOD WORKSHOP ON ENERGY CONSERVATION

Local weatherization activities should emphasize a combination of educational and governmental enforcement measures. Utility and community organizations are good resources for educating homeowners, tenants, and landlords about energy cost reduction opportunities, including financial and technical assistance programs. Master metering should be strongly discouraged, and conversion to individual metering encouraged when shown to be cost-effective. Municipal building and housing codes should be examined for ways to include economical energy efficiency standards in existing residential structures. These efforts are necessary to protect the affordability of housing in San Francisco.

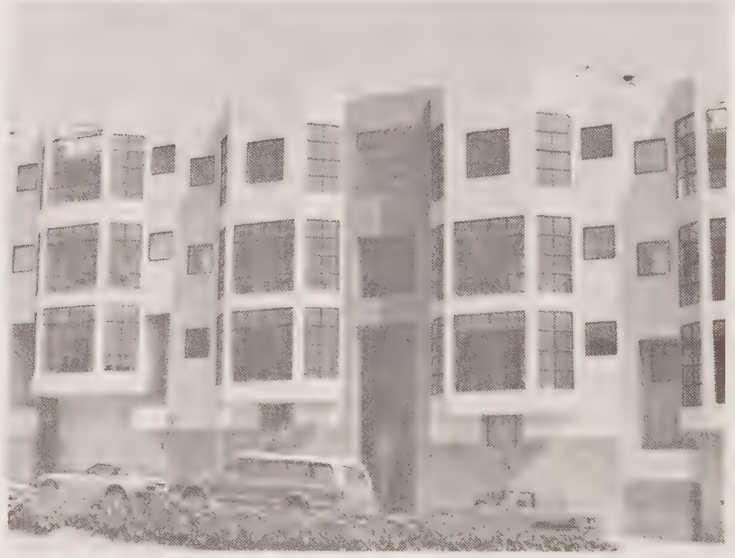
POLICY 2

STRENGTHEN ENFORCEMENT OF THE STATE'S RESIDENTIAL ENERGY CONSERVATION BUILDING STANDARDS.

California has adopted energy standards for new residential buildings and buildings undergoing extensive remodeling (Title 24). Homes and apartments constructed according to these standards are expected to consume approximately 40% less energy than comparable older units.

TITLE 24 ENERGY PLAN CHECK

The State has left enforcement of Title 24 energy standards to local government, without providing financial assistance for staff support. As a result, local government enforcement is uneven at best. It is important that San Francisco have an inspection staff that is knowledgeable about State energy standards for this region. In addition, there must be sufficient personnel to properly review plans and undertake site inspections to insure compliance with Title 24.



SOLARIUM DESIGN IN NEW HOUSING - GEARY BLVD.

POLICY 3

EXPAND THE ENVIRONMENTAL REVIEW PROCESS TO ENCOURAGE THE USE OF ADDITIONAL MEASURES TO SAVE ENERGY IN NEW HOUSING.

Designers of new housing should address the site as the first step in production of energy efficient housing. The primary energy needs of residental structures in San Francisco are space and water heating. Whenever practical, housing sites should be oriented to provide maximum exposure of living areas to sunlight and daylight. This will significantly reduce space heating and lighting needs.

Building technologies currently on the market make it economically feasible to produce energy efficient housing beyond the State adopted standards. These technology options include solar water heating systems, operational skylights for natural daylighting and ventilation, and co-generation and waste heat recovery systems in mixed use projects. Specific guidelines should be made available to assist developers in assessing specific technologies for new development projects.

POLICY 4

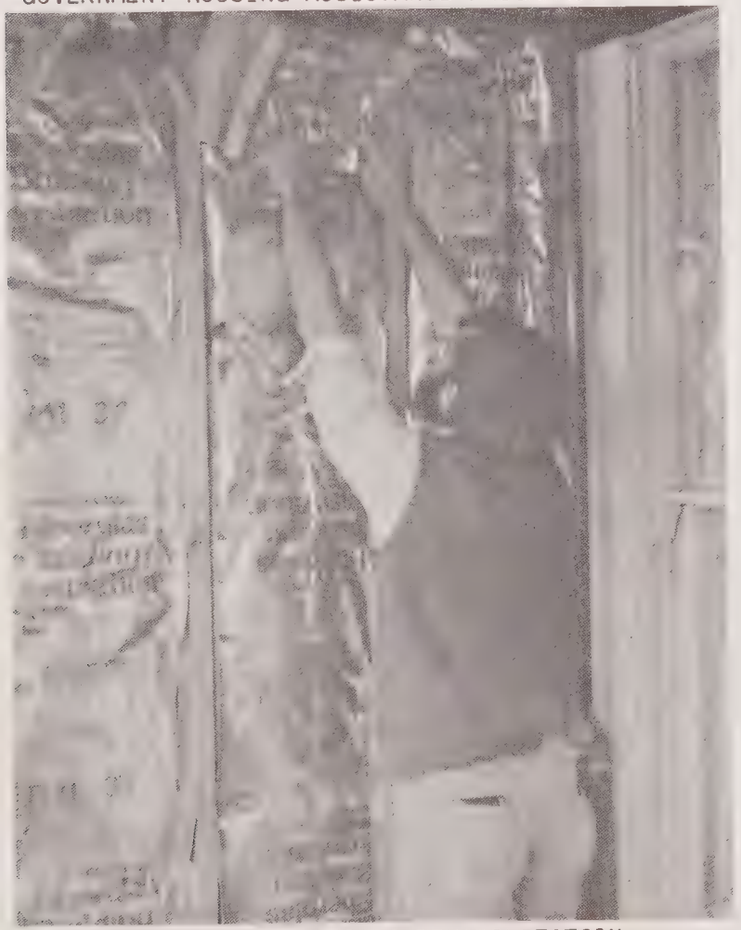
ENCOURAGE THE USE OF ENERGY CONSERVING APPLIANCES AND LIGHTING SYSTEMS.

Over two-thirds of San Francisco's residential electrical demand is devoted to the operation of refrigerators, household appliances and lighting systems. State and Federal legislation has set minimum efficiency standards for major new appliances and requires labels that reveal anticipated lifetime operational costs. Labeling, combined with educational programs, should make consumers more aware of the energy requirements of major household appliances such as refrigerators, stoves and heaters.

The use of fluorescent lighting systems for service areas, in combination with light dimmers for living areas, is a proven way to reduce electricity use while providing adequate lighting comfort.

POLICY 5

EMPHASIZE ENERGY CONSERVATION IN LOCAL GOVERNMENT HOUSING ASSISTANCE PROGRAMS.



INSULATION WORK IN HOUSING REHABILITATION

City housing agencies should take the lead in adopting energy conservation criteria into their housing programs. Reducing energy expenditures is an important part of providing affordable housing. Energy audit and weatherization work should be coordinated with the city's rehabilitation loan programs. Energy efficiency should be stressed in new subsidized units.

Redevelopment areas should be targeted as demonstration sites for the purpose of constructing energy efficient housing. Sites should be analyzed for their energy production potential. Housing construction within redevelopment areas should achieve lower energy budgets than currently allowed under State Title 24 energy standards, in order to set an example for other areas of the city.

POLICY 6

ADVOCATE REAL ESTATE ASSOCIATION PARTICIPATION IN RESIDENTIAL ENERGY MANAGEMENT PROGRAM EFFORTS.

Homeowners and investors increasingly seek information on utility bills prior to purchasing property. The general public relies on the opinion and expertise of the real estate industry on housing matters. As such, San Francisco's realtors should become actively involved in marketing energy management strategies to both home and apartment building owners. By educating clients on energy efficiency improvements that will reduce operating energy costs, the real estate industry would provide a valuable service in helping to upgrade San Francisco's housing, without the need for additional government regulations.

COMMERCIAL

OBJECTIVE 3

PROMOTE EFFECTIVE ENERGY MANAGEMENT PRACTICES TO MAINTAIN THE ECONOMIC VITALITY OF COMMERCE AND INDUSTRY.

The commercial sector is the fastest growing energy use sector in San Francisco. Commercial buildings consume over half of the electricity and over a quarter of the natural gas supplied to the city. Within this sector, electrical demand has been growing at a rate double the growth of total city demand. The current boom in new office construction will further increase commercial energy use. Energy conservation in commercial buildings, therefore, represents an important citywide objective.

In the commercial and industrial sectors, electricity is used for lighting, air conditioning, office equipment and welding operations, while natural gas is used for space and water heating, food storage/ preparation and metal fabrication. The greatest energy savings can be made through better management of lighting and better design and management of heating, ventilation and air conditioning (HVAC) systems. An effective conservation program will save businesses and industry substantial amounts of money that can be reinvested in the local economy. In the absence of efficiency improvements, energy expenditures by commercial and industrial users would be expected to triple in a decade.

ENERGY MANAGEMENT CONTROL SYSTEM

An effective commercial and industrial energy management program will require the participation of architects and design engineers, and representatives of organizations, such as the Building Owners and Managers Association, the Chamber of Commerce, and PG&E.

POLICY 1

INCREASE THE ENERGY EFFICIENCY OF EXISTING COMMERCIAL AND INDUSTRIAL BUILDINGS THROUGH COST-EFFECTIVE ENERGY MANAGEMENT MEASURES.

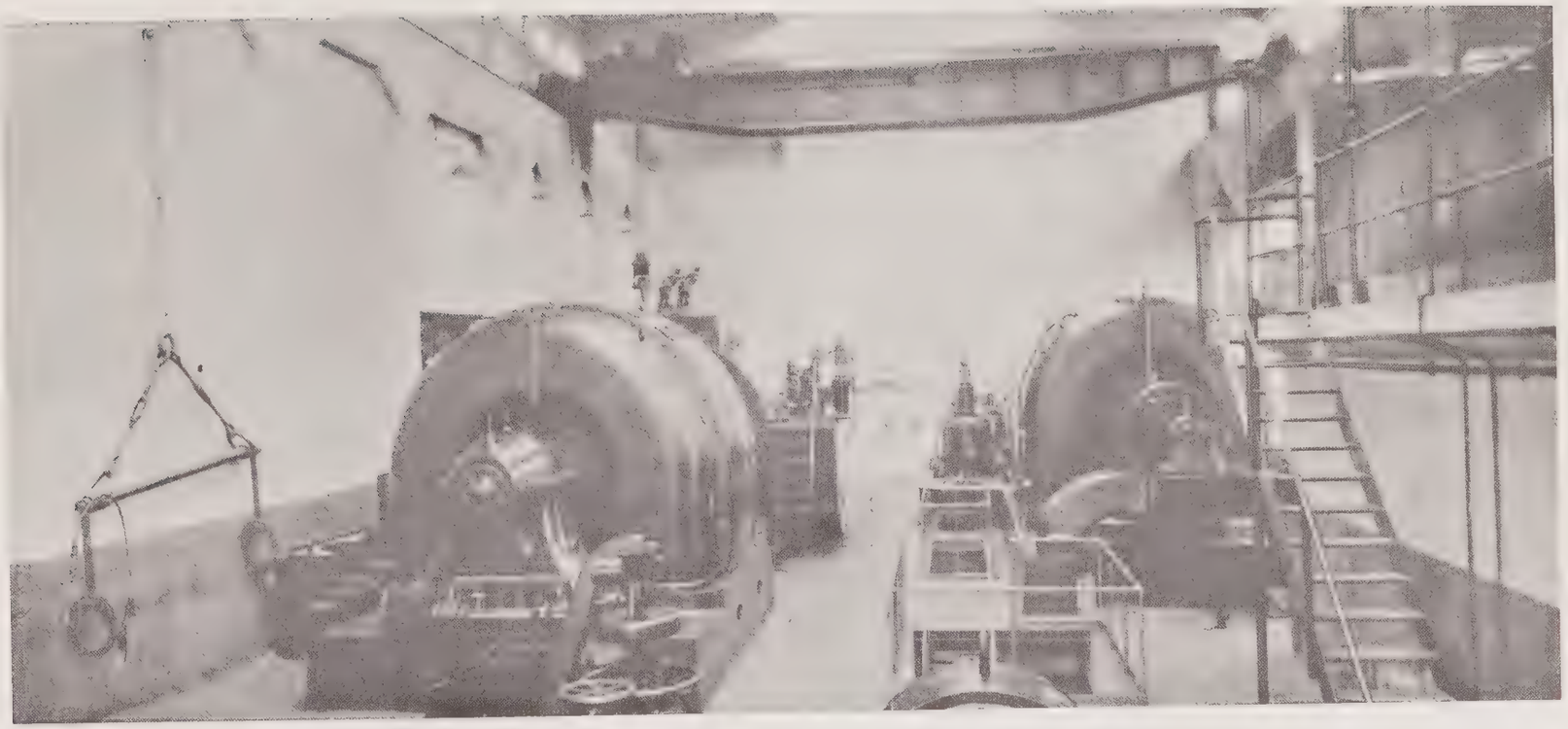
The vast majority of commercial and industrial buildings were constructed when energy costs were of little concern to architects and engineers. The costs associated with doing business in San Francisco have risen partially as a result of energy expenditures that have increased dramatically over the past decade. Many of the barriers to multifamily residential energy conservation apply to commercial structures as well. There is a diversity of building types and equipment in use, thus requiring specialized analysis for each structure. Many commercial businesses are tenants in master-metered buildings and are only indirectly held accountable for energy use through operating cost clauses in their leases.

There is a strong need for private business leadership in promoting energy efficiency in existing buildings. Key strategies to reduce operating energy loads involve proper maintenance and operation of mechanical systems. Lighting levels can be adjusted and incandescent lighting replaced with fluorescent, mercury and sodium alternatives. Computerized energy management systems can be an economical measure for large energy users. Commercial and industrial energy conservation is limited only by the innovation and imagination of building architects and engineers.

POLICY 2

INSURE ADEQUATE LOCAL ENFORCEMENT OF CALIFORNIA'S NON-RESIDENTIAL BUILDING STANDARDS.

The California Energy Commission has adopted and periodically reviews energy design standards for all new non-residential buildings (Title 24). The standards require that all new buildings be designed to use significantly less energy than buildings built



PG&E STEAM SYSTEM

prior to the passage of the new requirements.

The City is charged with the enforcement of the State building standards. Enforcement of the standards is a responsibility of the City's Bureau of Building Inspection (BBI). Conformance with the State's energy efficiency standards should be a priority in the City's building permit review process. This will require adequate training of building code inspectors on the energy components of the building standards.

POLICY 3

EXPAND THE ENVIRONMENTAL REVIEW PROCESS TO ENCOURAGE THE USE OF ADDITIONAL MEASURES TO SAVE ENERGY IN NEW COMMERCIAL BUILDINGS.

California Title 24 Standards do not reflect the state of the art in building efficiency design. There are a number of design features which have been used successfully in some San Francisco high rise buildings to further reduce energy consumption, e.g. the use of natural ventilation to reduce air conditioning demand. Detailed case studies should be undertaken to evaluate the performance of such features. This information should be shared with parties involved in building design and EIR preparation.

The environmental impact report (EIR) process is designed to review the potential environmental impacts associated with major new development projects. This process provides an opportunity for dialogue among the City, developer and public on a range of issues, including energy. Commercial case studies and energy research efforts should be undertaken to determine cost-effective energy conservation strategies, e.g. single metering, integrated energy systems, flextime to reduce peak transit use, that should be integrated into EIR procedures.

POLICY 4

PROMOTE COMMERCIAL OFFICE BUILDING DESIGN APPROPRIATE FOR LOCAL CLIMATE CONDITIONS.

The climate of San Francisco is dominated by the sea breezes characteristic of maritime climates. Because of the steady stream of marine air, there are few heat and cold extremes. Temperatures exceed 90 degrees F. on an average of once a year, and drop below freezing on an average of less than once a year.

Commercial building design should reflect San Francisco's climate. Buildings designed to take advantage of nearly year long westerly winds will be able to maximize natural ventilation opportunities. Heating,

ventilation and air conditioning (HVAC) systems should be designed with these climatic conditions in mind. These actions would reduce both operating costs and energy demand.

POLICY 5

ENCOURAGE USE OF INTEGRATED ENERGY SYSTEMS.

Integrated energy systems are a promising method for increasing the efficiency with which energy is used in commercial and mixed use projects. This concept encompasses a variety of systems. District heating and cooling systems deliver hot water or steam to buildings from a central location. San Francisco has three district heating systems serving the Civic Center and downtown areas, two of which are owned by PG&E. These systems are presently underused, despite considerable activity in new commercial office construction downtown. A feasibility study on providing steam service to new projects within or adjacent to the present steam distribution area should be undertaken. The present system could be operated more efficiently at lower unit cost with additional customers.

Other integrated energy technologies, such as co-generation and waste heat systems, use one fuel source to provide two or more end needs, thereby reducing overall energy requirements. Such systems might present a feasible and economically attractive energy supply option for new commercial office, mixed use and industrial projects. Initial studies should be undertaken to assess the potential application of these technologies on new development projects.

TRANSPORTATION

OBJECTIVE 4

INCREASE THE ENERGY EFFICIENCY OF TRANSPORTATION AND ENCOURAGE LAND USE PATTERNS AND METHODS OF TRANSPORTATION WHICH USE LESS ENERGY.

Transportation activities consume more than a third of San Francisco's total energy. Personal auto use accounts for more than half of total transportation energy use locally, and more than half of this total is for work commuting. The most obvious way to reduce this level of fuel consumption is to reduce personal auto use for both work and non work travel. Where people still must rely on autos, it is necessary to make more efficient use of them, by increasing both passenger loads and fuel economy.

Providing efficient transportation services in metropolitan areas is a complex problem. The best way to reduce transportation energy use is to increase the overall efficiency of transportation systems. Policies should be developed which take advantage of densities and location to reduce the need to travel and increase access to transit. Significant energy savings could result from construction of mixed use development projects that integrate employment with residential and shopping uses.

The benefits of reduced transportation energy use are clear. It will save money for both San Francisco's residents and business community while conserving critical fuel resources. This will, in turn, reduce the city's vulnerability to oil supply interruptions, with the added environmental benefit of lessening pollution and congestion.

MUNI METRO

POLICY 1

INCREASE THE USE OF TRANSPORTATION ALTERNATIVES TO THE AUTOMOBILE.

Transit remains one of the more energy efficient methods of accommodating personal transportation needs, particularly the daily commute to and from work. The City of San Francisco is fortunate to have an extensive transit system that is used and supported by local residents. As such, its continuance and expansion should be encouraged.

The system, however, is not without its problems. Local revenue sources are declining in proportion to the rising costs of maintaining existing service levels. The growth of commercial office development downtown, while increasing the local tax base, also imposes pressure to expand the existing service network in order to avoid both increased congestion and a reduction in transit service levels. A financing partnership should be established to maintain and enhance the city's energy efficient transportation network. Financing mechanisms should be pursued to allocate the costs associated with increased transit service demand. In addition, a variety of transportation alternatives, including the provision of bicycle, jitney, and pedestrian facilities, should be carried out through both public and private transportation energy management programs.

POLICY 2

PROVIDE INCENTIVES TO INCREASE THE ENERGY EFFICIENCY OF AUTOMOBILE TRAVEL.

Increasing the energy efficiency of automobile travel should be a major local transportation energy policy. Incentives should be instituted to increase the number of passengers per vehicle for local travel. Preferential parking for carpools and van pools, restrictions on the availability of long term

parking for single occupant vehicles, and continuance of state tax credits for employers who implement carpool and vanpool programs, are some of the ways to encourage energy efficient high occupancy auto travel. In addition, the city can promote use of fuel efficient vehicles through implementation of preferential parking policies for smaller autos, and reducing the size of off-street parking spaces.

VAN POOLING

HIGH OCCUPANCY VEHICLE LANES

COMMUTING BICYCLIST

POLICY 3

ENCOURAGE AN URBAN DESIGN PATTERN THAT WILL MINIMIZE TRAVEL REQUIREMENTS AMONG WORKING, SHOPPING, RECREATION, SCHOOL AND CHILDCARE AREAS.

An energy efficient transportation system is highly dependent on local land use policies. San Francisco's high density, compact form lends itself to the use of various transportation alternatives in order to satisfy the daily needs of local residents. Recent developments, however, could seriously alter this balance. New housing has not kept pace with the growth in local employment, imposing pressure on existing housing and encouraging housing growth outside the city. Commercial neighborhood districts are under intense development pressure, forcing certain neighborhood services to move outside the area. These trends increase distances, and thus energy requirements, for personal travel.

The city should implement programs that reinforce San Francisco's present urban design pattern. Housing conditions placed on new commercial office development projects should emphasize the provision of housing at or near employment centers. Neighborhood commercial policies should promote the continued presence of diverse local service establishments. These policies would enhance the city's existing urban character, while keeping personal transportation energy requirements to a minimum.

POLICY 4

PROMOTE MORE EFFICIENT COMMERCIAL FREIGHT DELIVERY.

Better designed and more adequate space for freight loading in major high rise commercial buildings will increase the energy efficiency of the transportation system by minimizing traffic congestion. San Francisco should aggressively enforce recently enacted off-street freight loading and service vehicle space requirements. The City should also examine the feasibility of establishing satellite freight centers to reduce truck movement into the downtown.

POLICY 5

ENCOURAGE CONSIDERATION OF ENERGY USE ISSUES WHEN MAKING TRANSPORTATION INVESTMENT DECISIONS.

The development of new transportation facilities can either increase total energy demand or encourage greater energy conservation. The funding of highway and transit projects is complex and involves the agreement of many government agencies. San Francisco should work with other local governments and regional agencies to ensure that future transportation plan development is consistent with its transportation and energy policies, both of which emphasize energy conservation.

POLICY 6

PROMOTE ALTERNATIVE WORK ARRANGEMENTS WHICH WILL CONTRIBUTE TO MORE EFFICIENT TRANSPORTATION USE.

Currently, the work trip is the largest single component of personal transportation needs, responsible for peak service loads and overcrowding of the existing transportation system. Energy savings could be achieved through more efficient utilization of the existing transit system. Alternate work arrangements, such as flex-time or staggered work hours, have the potential for increasing the efficiency of the existing transportation system while reducing the need for system expansion.

TRANSIT PREFERENTIAL LANE

ALTERNATE ENERGY

PASSIVE SOLAR OFFICES - SIERRA CLUB

OBJECTIVE 5

PROMOTE THE USE OF RENEWABLE ENERGY SOURCES.

Renewable energy is a term applied to energy sources which do not rely on finite reserves of fossil or nuclear fuels. These sources are directly or indirectly due to the sun, with the exception of tidal energy, and include such forms as solar, wind, biomass, and hydro. Renewable energy sources are non-depletable; hence, their use reduces dependence on conventional fossil fuels, particularly from foreign sources. They are relatively benign to the natural environment. In addition, renewable energy sources tend to be labor intensive, encouraging the growth of local enterprises and jobs. For these reasons, their use should be actively encouraged.

SOLAR HOT WATER SYSTEM RETROFIT

All City agencies should give greater consideration to the potential use of renewable energy systems. Land use and regulatory codes should integrate renewable energy concerns. Solar access issues should be identified and local approaches developed to facilitate the use of various systems for space and water heating needs. Local government codes have, directly or indirectly, encouraged greater energy use and discouraged investments in renewable energy technologies. Changes in land use policies and regulatory codes can significantly increase local reliance on renewable energy resources. These programs include expediting permit applications, consumer protection, information services, and special programs for low-income residents and small commercial businesses. Local government should be committed to

undertaking this re-examination in order that it might better reflect a position of leadership in support of renewable energy sources.

POLICY 1

DEVELOP LAND-USE POLICIES THAT WILL ENCOURAGE THE USE OF RENEWABLE ENERGY SOURCES.

Steps should be taken to protect areas offering high solar energy collection potential, such as south facing slopes, from being shaded. Solar access strategies will differ according to existing and proposed height and bulk regulations. South wall and rooftop solar access may be achievable in low density residential districts. Rooftop access should be possible in medium to high density residential, commercial and mixed use districts. If new development impairs the performance of existing systems, compensatory or mitigation measures should be taken.

POLICY 2

REMOVE OBSTACLES TO ENERGY CONSERVATION AND RENEWABLE ENERGY SYSTEMS IN ZONING AND BUILDING CODES.

A detailed analysis of zoning and building codes should be performed, particularly in terms of problems encountered by persons who have installed or tried to install systems. The National Association of Building Officials has anticipated many such problems and has developed a Uniform Solar Code to facilitate installation of solar equipment. The California Energy Commission has developed model solar access and wind legislation. These codes should be reviewed for possible adoption in San Francisco. In addition, constraints in existing

SOUTH FACING HILLSIDE - SOLAR POTENTIAL

USE OF NATURAL LIGHT - LEVI PLAZA

local codes and permit procedures should be analyzed and modified, if the modifications do not conflict with basic health and safety concerns.

POLICY 3

DEVELOP INFORMATION RESOURCES TO ASSIST IN THE USE OF RENEWABLE ENERGY.

Providing reliable information is an important activity in the marketing of renewable energy. Such information can motivate individuals to install energy conservation measures and renewable energy technologies. However, a key part of a successful information service program involves developing materials best suited to individual needs.

Local information services should not duplicate work proceeding at other government and utility levels but, instead, focus on local concerns: system performance in San Francisco, applicable planning and building codes, solar orientation, system sizing and access criteria, consumer protection programs, and technical assistance on solar and wind audits. A local renewable resource information service should keep citizens informed of technology developments, while acting as a clearing house on land use and code requirements. Monitoring existing solar installations is necessary to develop reliable information on expected performance. Such information is essential to those making decisions involving the local use of renewable resources.

OBJECTIVE 6

SUPPORT FEDERAL, STATE AND PG&E ENERGY PROGRAMS THAT ARE EQUITABLE, AND ENCOURAGE CONSERVATION AND RENEWABLE ENERGY USE.

Local energy programs should be tied closely to existing Federal and State laws. The complexity of energy supply and distribution systems, in addition to social equity and economic considerations, require coordination of government and utility energy plans. Local energy management efforts should be designed to inform and support local residents and businesses in using available Federal, State and utility energy assistance programs.

To carry out this objective, San Francisco should monitor energy legislation at all government levels and maintain an open dialogue with public and private agencies which have energy planning programs underway.

POLICY 1

SUPPORT CONTINUATION OF STATE AND FEDERAL TAX INCENTIVES AND CREDITS FOR CONSERVATION AND RENEWABLE ENERGY TECHNOLOGIES.

Conservation and renewable technologies are, for the most part, economical methods to reduce utility operating costs. Their widespread use, however, is dependent on the decisions of individuals and business firms to invest in these technologies. The initial costs associated with conservation and renewable energy systems dissuade individuals from investing in these technologies, regardless of potential long term benefits in reduced operating expenses. Federal, State and utility financing programs are necessary to reduce, or defer the initial costs of investing in conservation or renewable energy resources, in order to make the investment option attractive to the individual. Tax credits, depreciation allowances, and low interest loans are but a few examples of financing incentives currently in place which, when combined with high energy bills, are convincing utility customers to invest in conservation and renewable energy.

Financing incentives for small business and apartment building owners are of particular importance. Small businesses typically lack the capital to invest in energy technologies that would reduce long term operating costs. Many small businesses are tenants and thus are not responsible for making structural improvements and/or changes to the buildings they occupy. Owners of apartment buildings face a different disincentive. Generally, these owners either do not pay their tenants' utility bills, or pass on the operating costs to tenants as part of rents. Investments will occur only if building owners are offered financial incentives, e.g. tax credits, to offset investment income.

POLICY 2

PROMOTE STATE ENERGY BUILDING STANDARDS THAT ARE COST-EFFECTIVE AND TAKE INTO ACCOUNT SAN FRANCISCO'S CLIMATE AND DENSITY PATTERNS.

The California Energy Commission has recently revised its energy standards for new building construction. The new standards are intended to reduce energy costs by relying on increased ceiling and wall insuation, thermostat controls, fluorescent lighting, double and triple paned windows, passive solar design and solar water heating systems. Although these energy standards will increase initial building costs, they will, in the long run, provide an economic benefit to consumers by reducing operating costs during the life of the building.

Local governments have the opportunity to review energy standards for their region and propose alternatives that can be demonstrated to be both cost effective and save as much, or more energy, than the state standards. San Francisco has a topography, density and climate pattern that is unique in the state. It is in the city's interest to review the state energy building standards to determine their cost-effectiveness for this area, as well as the ease of implementation.

POLICY 3

ENCOURAGE PG&E INVOLVEMENT IN ENERGY MANAGEMENT PROGRAMS FOR RESIDENTIAL, COMMERCIAL AND INDUSTRIAL USERS.

PG&E is actively involved in customer-related energy conservation activities. Examples of existing programs include residential energy

audits and information referrals, low-interest loans, award and promotion programs for energy efficient building design, street light conversion, and commercial and residential load management programs.

Load management offers great potential for holding down the cost of electricity. It is a strategy to influence consumers' use of electricity by time-differentiated pricing - charging rates that reflect the cost of supplying a level of demand by either time of day or season. In the PG&E service territory, afternoons are a time of daily "peak" electricity demand, while summer afternoons represent a period of system "peak" demand.

San Francisco is experiencing a rapid increase in commercial office development activity. This activity is expected to increase significantly both the daily and seasonal "peak" electrical requirements of the local service area, since commercial office energy use is primarily for air conditioning, lighting and office equipment. Expansion of utility load management programs into the downtown office district could relieve "peaking" requirements by shifting electricity loads to times when base load generation could be more effectively used. Commercial customers could lower their operating costs, while reducing the need for P.G. and E. to purchase expensive oil and natural gas.

Evidence to date suggests a positive correlation between financial responsibility for energy use and reduced levels of energy consumption. Commercial and residential tenants who do not directly pay their utility bills will generally consume larger amounts of energy than those held directly accountable. Commercial and residential master metering practices should be examined and alternatives encouraged which place direct responsibilities on tenants for energy use.

FINANCING

OBJECTIVE 7

DEVELOP FINANCING OPPORTUNITIES TO IMPLEMENT LOCAL ENERGY PROGRAMS

One of the major energy issues facing San Francisco is the unequal consequences escalating prices have on different segments of the community. Three of the groups most seriously affected by price increases are lower and fixed income renter populations, energy-intensive small neighborhood businesses such as restaurants and corner grocery stores, and certain industries that require large quantities of heat for manufacturing.

While the implementation of low cost and no cost conservation measures are a first step to reduce energy bills, over the long term, investments in conservation measures and renewable energy will be needed. Fixed income renter populations often use large amounts of gas for space heating, and large amounts of electricity to operate relatively inefficient older appliances. Over the long run, weatherization, more efficient HVAC systems, and the use of solar systems to provide hot water will help alleviate increasing utility costs for fixed income renters. Without such improvements, the city's efforts to stabilize rent costs and protect the affordability of housing will be compromised.

Access to loans or other financing options to install these measures is critical. The City should investigate possibilities for acquiring funding to assist or subsidize residential and private business improvements if other sources of financing are not available. This effort should be targeted to fixed and lower income populations, energy-intensive small businesses such as restaurants and corner grocery stores, and local energy intensive industries.

STREET LIGHT CONVERSION -
BUREAU OF LIGHT AND POWER

POLICY 1

PROMOTE GOVERNMENT AND PRIVATE FINANCING PARTNERSHIPS TO CARRY OUT LOCAL ENERGY PROGRAMS.

Creative use of State and Federal financial assistance programs should be explored. A local revolving fund, through the issuance of revenue bonds, might be established to undertake local energy conservation programs. Tax-exempt leasing and lease-purchase arrangements offer another promising method to implement energy conservation and renewable resource strategies.

A local non-profit energy corporation could provide a means to channel financing resources to local conservation programs. Local governments can assist in the formation of special assessment districts to undertake energy projects. Such a district could be applied to certain industrial and neighborhood areas for the production, sale and use of alternate energy systems.

Government and utility involvement is particularly appropriate in hardship and low income situations. San Francisco's utility user tax (5% of PG&E billings) may provide a funding source for an energy conservation loan program geared to low-income residents. The City should encourage PGandE to aggressively market its zero interest loan (ZIP) program to San Francisco's low-income and elderly residents.

POLICY 2

ENCOURAGE PRIVATE FINANCIAL INSTITUTIONS TO OFFER ENERGY LOAN PROGRAMS RESPONSIVE TO LOCAL MARKET NEEDS.

Local lending institutions are important sources for financing commercial and residential conservation. A pioneering program involving solar "T-bills", which are earmarked for solar system financing, has been successfully developed in San Francisco. San Francisco lenders have also taken the lead in supporting State legislation to create a secondary market for solar loans. Continued innovation and more aggressive participation by additional lenders is needed to service and promote a growing energy investment market.

POLICY 3

ESTABLISH A SELF-SUPPORTING SYSTEM FOR FUNDING MUNICIPAL ENERGY COST REDUCTION INVESTMENTS.

The City should explore the feasibility of establishing a revolving loan fund, using Hetch Hetchy revenues, to undertake municipal electrical conservation programs. All electricity conserved from these investments not only will reduce expenditures for electricity, but will also generate additional revenues to Hetch Hetchy, since conserved electricity can be sold at rates two to three times higher than the rate charged to City departments. These additional revenues can be used to finance future energy-saving investments in natural gas, which will, in turn, further reduce budgetary expenditures and generate additional net revenue.

GLOSSARY

British Thermal Unit: (BTU) The amount of heat needed to raise one pound of water (approximately 8.3 gallons) one degree Fahrenheit. Both electricity (kilowatts) and natural gas (therms) can be converted to BTUs. BBTU is a billion BTU.

Co-generation: Any of several processes which use either power generation reject heat to satisfy process heat requirements, or process waste heat for steam generation of electricity.

Cost-effective: Determination that a financial investment today in a given technology or program will produce an adequate financial return in reduced costs.

District Heating: A system which provides residential and commercial space heating for a neighborhood or large complex of buildings from a central heat source. District heating, which exists in San Francisco, could also provide opportunities for co generation.

Energy Audit: The measurement of energy flow within a structure for the purpose of measuring energy waste and potential savings. Subsequent recommendations usually include operational improvements and retrofitting.

Energy efficiency: The degree to which energetic input yields a desired output (e.g. work or space heating).

High Pressure Sodium Vapor: A high efficiency light-emitting electric bulb; more efficient than standard mercury vapor street lights.

Kilowatt Hour: The basic unit of electrical energy, equal to one kilowatt of power supplied to or taken from an electrical circuit for one hour (1000 watts). One kilowatt hour is equal to 3,412 BTU.

Master Metering: A single utility company electric or gas meter which serves on structure or building with multiple tenants. Tenants typically are not directly billed for master metered services.

Natural Gas: A natural hydrocarbon gas composed typically of methane, ethane, butane and propane. It comes from terrestial wells with or without accompanying crude oil and is generally much higher in heat content than manufactured gas.

Non renewable energy resources: Energy resources that rely on oil, gas, coal and/or nuclear sources.

Payback: In this document, the time it takes to recover a financial investment in energy conservation or solar technology through reduced payments for energy use.

Renewable energy technologies: Technologies using energy resources that are sustainable over time or that have slow rates of depletion such as solar, wind, biomass, solid waste, geothermal, co generation and hydropower.

Residential Conservation Service: (R.C.S.) A Federal mandate that utility companies provide energy audits for residential customers.

Retrofit: Upgrading of an existing systems through subsequent addition of new components. In terms of energy conservation, addition of materials or devices to an existing building to achieve energy conservation (for example, insulation).

Solar access: Access which prevents solar energy collection (heat absorbing) areas from being blocked or shadowed from direct sun exposure.

Therm: A unit of measurement for natural gas, equivalent to 100,000 BTUs.

Waste conversion: Recovery of energy as an adjunct to waste disposal. It may involve pyrolsis (heating to produce gas or oil); hydrogenation (chemical reduction of materials to produce oil); or fermentation ("digestion") of activated sewerage sludge to produce methane.

Weatherization: A set of measures such as insulation, caulking, and weatherstripping, which reduce heat loss (infiltration) in buildings.

INSERT IN COLUMN 2, PAGE 7, the following:

Amendment

AMENDMENT TO THE BAY, OCEAN AND SHORELINE OBJECTIVE OF THE CONSERVATION SECTION OF THE ENVIRONMENTAL PROTECTION ELEMENT

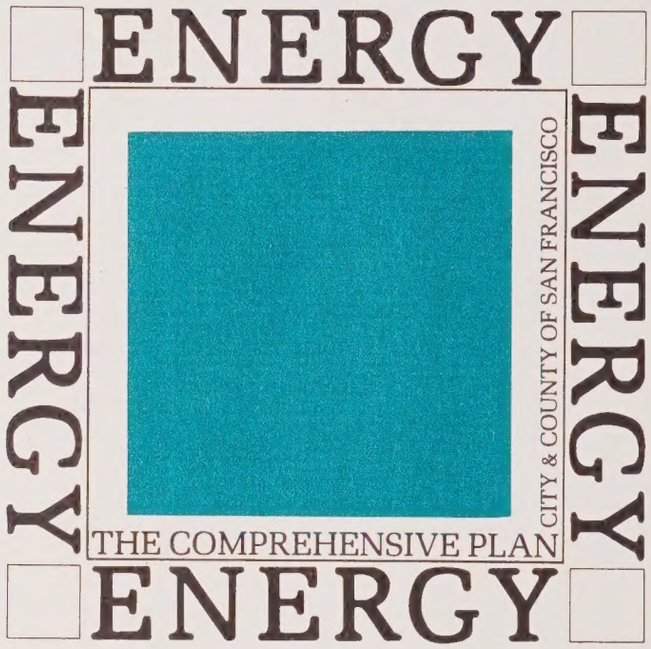
(Adopted by Resolution No. 9409 on June 3, 1982.)

Policy 5:

PROTECT SENSITIVE ECONOMIC AND ENVIRONMENTAL RESOURCES IN NORTHERN CALIFORNIA OFFSHORE COASTAL AREAS THREATENED BY OIL DEVELOPMENT.

The regional economy of Northern California, heavily dependent on tourism and commercial fishing, is threatened by offshore oil and natural gas development in the Outer Continential Shelf (OCS) ocean area. Of particular significance to San Francisco is proposed development in the area within the Pt. Reyes-Farallon Island Marine Sanctuary, an important local fishery resource.

The official City position supports continued protection of environmentally sensitive coastal areas that are important to local economic activities. It is imperative that the City make its position known by participating in State Coastal policy review to ensure that local concerns are taken into account by Federal decision-makers.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CITY & COUNTY OF SAN FRANCISCO